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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/825,547

04/14/2004

Joe E. Stout

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02/18/2005

HEWLETT-PACKARD COMPANY

Intellectual Property Administration

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EXAMINER

PHAM, HAI CHI

ART UNIT

PAPER NUMBER

2861

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/825,547

Applicant(s)

STOUT ET AL.

Examiner

Hai C. Pham

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-24 and 26-46 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/24/04</u> . | 6) <input type="checkbox"/> Other: _____ |

FINAL REJECTION

Terminal Disclaimer

1. The terminal disclaimer filed on 11/29/04 disclaiming the terminal portion of any patent granted on this application, which would extend beyond the expiration date of U.S. Patent No. 6,739,519 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Objections

2. Claim 38 is objected to because of the following informalities:

- Line 7, "is is" should read --is--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 38, 40-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Radke et al. (U.S. 5,859,654).

Radke et al. discloses an ink jet print head comprising a heating element (not shown) (col. 1, lines 20-36), a cover layer supported on the substrate surface, the cover layer defining a firing chamber (32) formed about the heating element and defining a nozzle (17) over the firing chamber, wherein the cover layer includes a plurality of layers

(barrier layer 24, orifice plate 14 and top coat layer 16) including a primer layer (intermediate layer 27) supported by the substrate surface (substrate 29), wherein at least one outer edge of at least one other of the cover layers is offset from the outer edge of the primer layer to expose a surface of the primer layer (Fig. 1).

Radke et al. further teaches:

- The cover layer includes a countersunk bore about the nozzle (17),
- Wherein the cover layer includes a top coat layer (16) smoothing an upper surface of the cover layer,
- The top coat including a non-wetting surface (the coating 16 is made of gold).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 22-24, 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al. (U.S. 5,681,764) in view of Smith et al. (U.S. 6,302,523) and Mrvos et al. (U.S. 6,409,312)

Hess et al. discloses an ink jet print head comprising a heating element (strip 221 forming the resistive heater RD) on a substrate surface (162), a cover layer on the substrate surface, the cover layer defining a firing chamber (ink well 230) formed about the heating element and defining a nozzle (orifice 232) over the firing chamber, wherein the

cover layer includes a primer layer (insulating layer 222), a chamber layer (ink barrier 226), a nozzle layer (orifice plate 228).

Hess et al. fails to teach the top coat layer being included in the cover layer.

Smith et al. discloses an ink jet print head comprising a heating element (146, Fig. 4) on a substrate surface (142), a cover layer on the substrate surface, the cover layer defining a firing chamber (ink well 230) formed about the heating element and defining a nozzle (nozzle 153) over the firing chamber (space formed above the heating element 146), wherein the cover layer includes a chamber layer (flow directing layer 150), a nozzle layer (nozzle plate 152) and a top coat layer (coating 158).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a top coat layer at the outer surface of the orifice plate of Hess et al. device as taught by Smith et al. The motivation for doing so would have been to provide a water and ink repellent layer at the outer surface of the orifice plate for easy clean-up of the remnant ink after each printing operation.

Hess et al. also fails to teach the cover layer including dry film layers (claim 26), at least two SU8 layers (claim 27).

Mrvos et al. discloses an ink jet printer and a process of fabricating the ink jet print head, wherein the first and second layers (44 and 52) forming the cover layer to define the firing chamber (ink chamber 46) and the nozzle (50), respectively, are photo-imaged polymer, dry film or SU8 layers (col. 5, lines 53-65).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the barrier layers with photo-imaged polymer, dry film or SU8 for structuring the ink jet print head in the device of Hess et al. as taught by Mrvos et

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al. The motivation for doing so would have been to provide a malleable material and a simple method for processing the ink jet print head with accurate alignment between the resistor and the associated nozzle as suggested by Mrvos et al. at col. 5, lines 45-51.

7. Alternatively claims 22-24, 26-29, 34-37, 39 and 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Radke et al. in view of Mrvos et al.

Radke et al. discloses an ink jet print head comprising a heating element (not shown) on a substrate surface (29), a cover layer on the substrate surface, the cover layer defining a firing chamber (ink chamber 32) formed about the heating element and defining a nozzle (orifice 17) over the firing chamber, wherein the cover layer includes a primer layer (intermediate layer 27), a chamber layer (barrier layer 24), a nozzle layer (orifice plate 14). With regard to claim 28, Radke et al. further teaches the cover layer including a top coat layer (16).

Radke et al. fails to teach the cover layer including polymer layer, dry film and at least two SU8 layers.

Mrvos et al. discloses an ink jet printer and a process of fabricating the ink jet print head, wherein the first and second layers (44 and 52) forming the cover layer to define the firing chamber (ink chamber 46) and the nozzle (50), respectively, are photo-imaged polymer, dry film or SU8 layers (col. 5, lines 53-65).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the barrier layers with photo-imaged polymer, dry film or SU8 for structuring the ink jet print head in the device of Hess et al. as taught by Radke et al. The motivation for doing so would have been to provide a malleable material and a

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simple method for processing the ink jet print head with accurate alignment between the resistor and the associated nozzle as suggested by Mrvos et al. at col. 5, lines 45-51.

Radke et al. further teaches the outer edge of the firing chamber (32) being offset to expose a surface of the prime layer (intermediate layer 27) (Fig. 1).

8. Claims 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mrvos et al. in view of Smith et al.

Mrvos et al. discloses an ink jet printer and a process of fabricating the ink jet print head, the ink jet print head including a resistor (heater resistor 22) on a substrate surface (14), and a first polymer layer (polymer layer 44) formed over the substrate surface and surrounding the resistor, and a second polymer layer (polymer layer 52) formed over the first polymer layer and defining the nozzle (50) over the firing chamber (see Fig. 3).

Mrvos et al. fails to teach the top coat layer.

Smith et al. discloses an ink jet print head comprising a heating element (146, Fig. 4) on a substrate surface (142), a cover layer on the substrate surface, the cover layer defining a firing chamber (ink well 230) formed about the heating element and defining a nozzle (nozzle 153) over the firing chamber (space formed above the heating element 146), wherein the cover layer includes a chamber layer (flow directing layer 150), a nozzle layer (nozzle plate 152) and a top coat layer (coating 158).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a top coat layer at the outer surface of the second polymer layer of Mrvos et al. device as taught by Smith et al. The motivation for doing so

would have been to provide a water and ink repellent layer at the outer surface of the orifice plate for easy clean-up of the remnant ink after each printing operation.

Mrvos et al. further teaches:

- the first and the second polymer layers (44 and 52) comprising SU8 (col. 5, line 66 to col. 6, line 18),
- one of the first and the second polymer layers (44 and 52) including dry film (col. 5, line 52-56),
- offsetting at least one outer edge of the first layer from a respective outer edge of the substrate so as to provide space for forming conductive pads to activate the heater resistors (col. 4, lines 57-63).

Allowable Subject Matter

9. Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the indication of the allowability of claim 25 is the inclusion therein, in combination as currently claimed, of the limitation "a third layer between the nozzle layer and the chamber layer, wherein the third layer comprises a photon barrier layer and at least partially defines the nozzle", which is not found taught by the prior art of record considered alone or in combination.

Response to Arguments

11. Applicant's arguments with respect to claims 22-24 and 26-46 have been considered but are moot in view of the new grounds of rejection presented in this Office action.

Conclusion

12. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (571) 272-1934. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM
PRIMARY EXAMINER

February 15, 2005